

## Corner Cube Mounting

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The configuration of the panel/actuator interface is just about finalized. The latest efforts have dealt with placement of the corner cubes so the laser could look through the associated holes in the surface panel unobstructed.

As stated in GBT memo 64, there should be three corner cube offset angles: 25, 35, and 45 degrees. These offsets are the angle between the cube normal and the local surface normal. All normal lines pass through the antenna axis. Also shown in memo 64, figure 7 are the maximum angles of incidence for the three offset angles at the three laser camera positions. A summary of these angles would be:

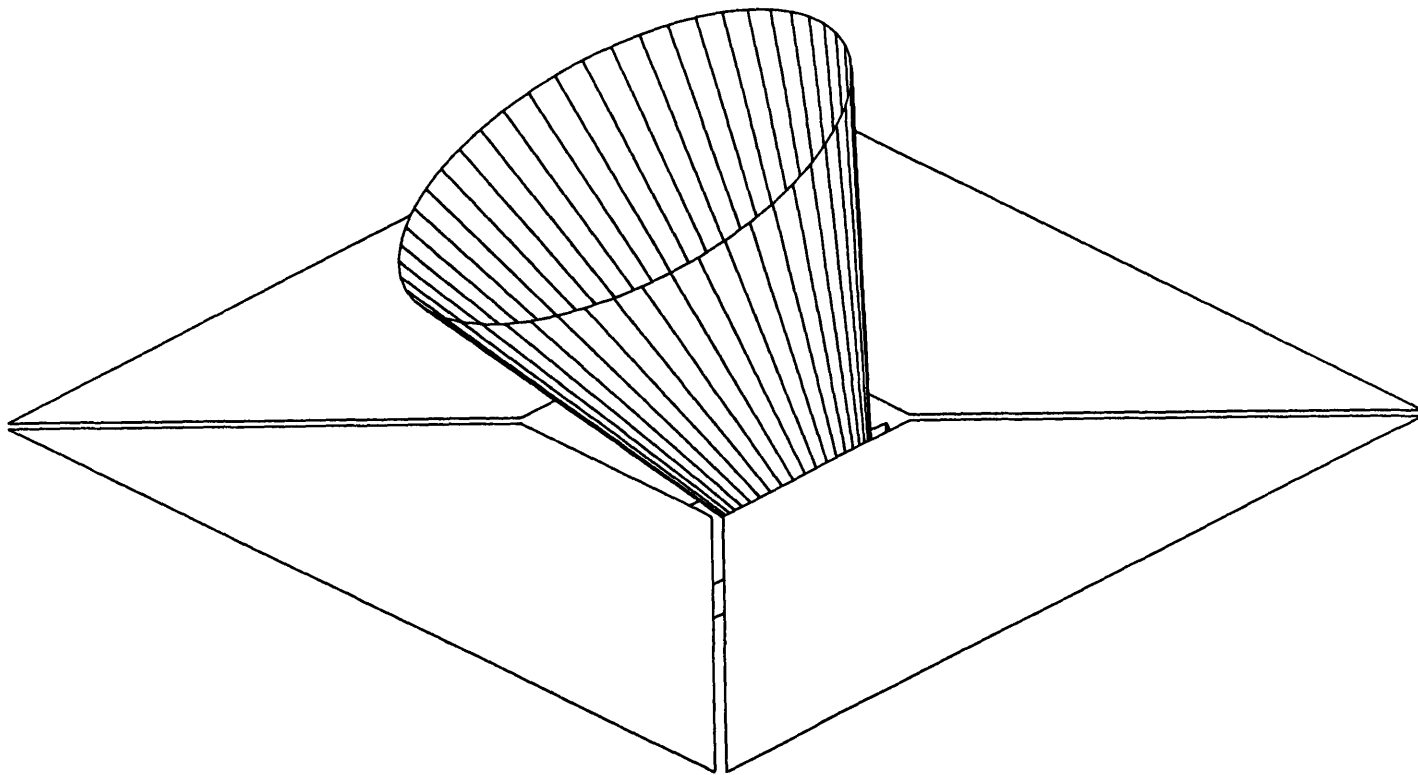
45 degree offset  $\approx$  15 degree maximum angle of incidence  
35 degree offset  $\approx$  15 degree maximum angle of incidence  
25 degree offset  $\approx$  23 degree maximum angle of incidence

To check the clearance in the surface panel a cone whose half angle is equal to the maximum angle of incidence was projected from the 1-inch diameter cube through the surface. At 25 and 35 degree offsets the cone did not interfere with the surface panel opening. These are shown in figures 1 and 1a. At 45 degrees, however, the interference was severe and simple relocation of the cube did not move the cone into a clear pattern.

The actual camera look angles to the corner cubes were then employed to define the actual required opening instead of a simple cone. These angles are defined in figures 2 and 2a and plotted in figures 3 and 4. To summarize, the camera positions P2 and P3 look at the cube up to 6 degrees off the radial line, and up to 14 degrees below the cubes normal within the limits of the above described 6 degrees. Camera P1 looks along the radial at up to 15 degrees angle of incidence. This can be visualized as a cylinder tilted 15 degrees up from the cube normal. A 3-D surface was generated using the above parameters, and it was located to clear the opening in the surface. This is shown in figure 5.

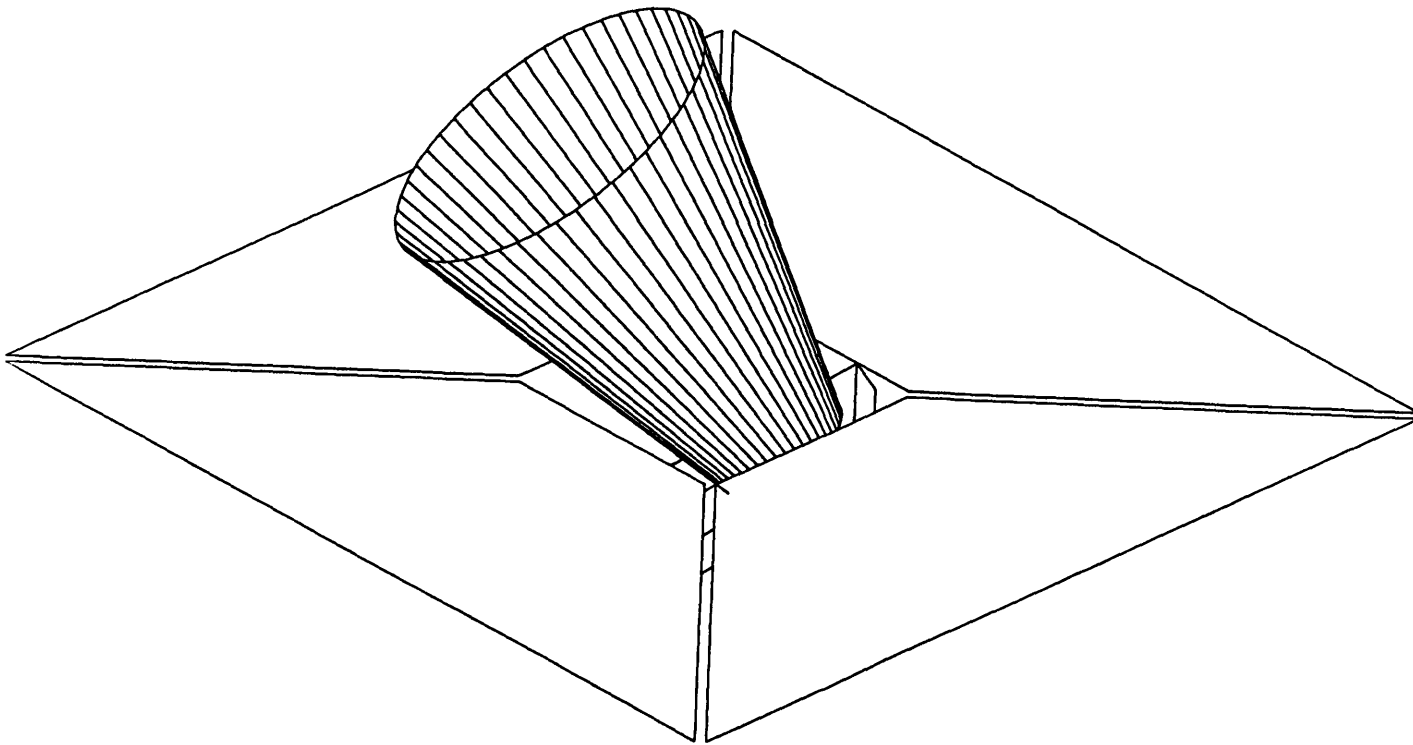
Since there are two tiers of transition panels, two panel corners, located in the 45 degree offset zone and one in the 35 degree zone, special brackets are needed to move the cube mounting from the actuator centerline. The standard brackets are shown in figures 6, 7, and 8 while the special brackets are shown in figures 9 and 10. The holes in the transition tier panels are rectangular and should be at least 2.50" along the radial and 1.75" wide. The 45 degree offset beam is shown passing through a transition tier in figure 11.

I will conclude by saying that these values are based solely on the data given in memo 64. If the laser cameras are moved from their respective locations, then the mounting brackets will probably have to change. Also, I thank Fred Schwab for providing the data used for this report.



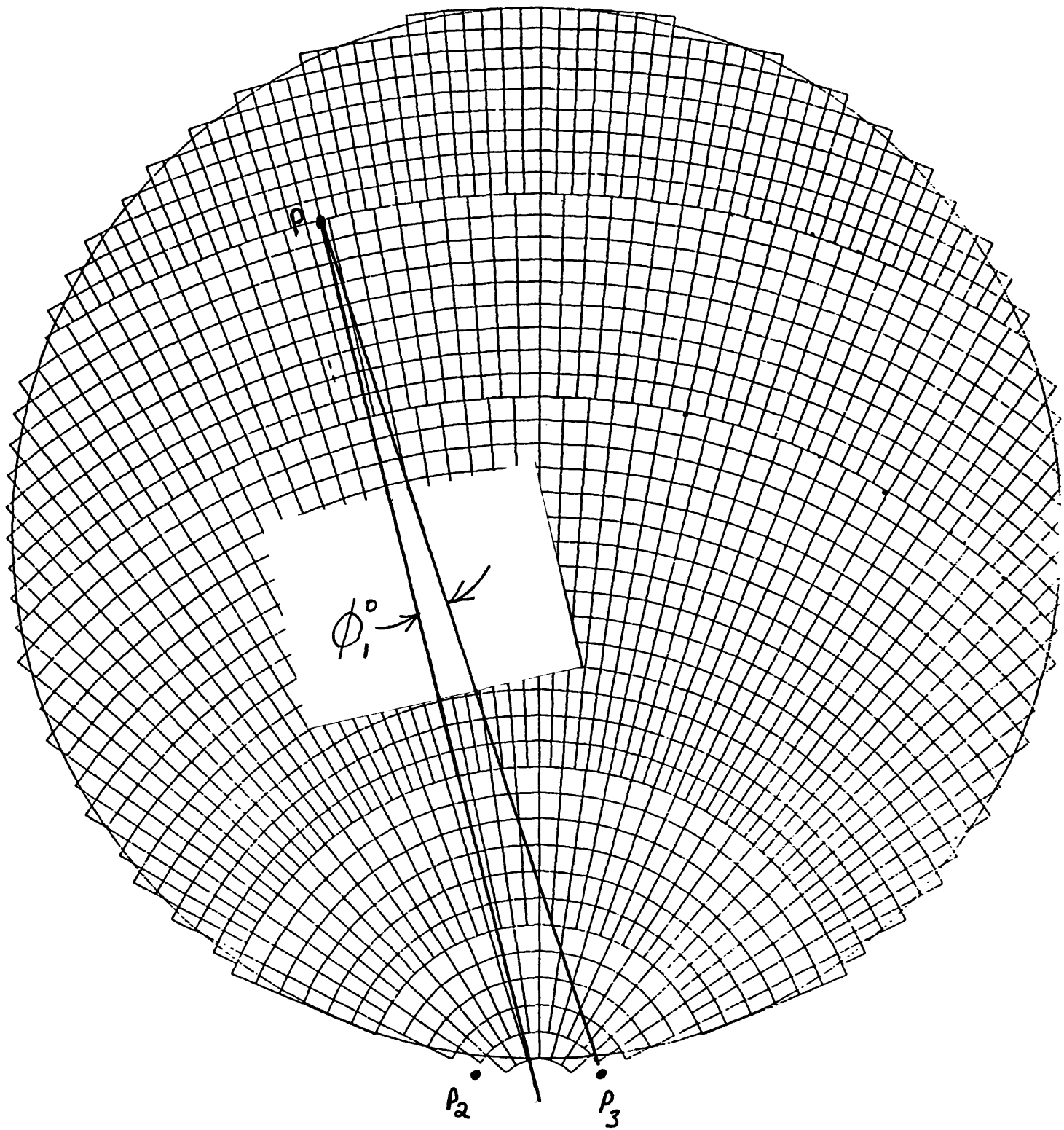
23° CONE THROUGH  
SURFACE AT 25° OFFSET

Figure



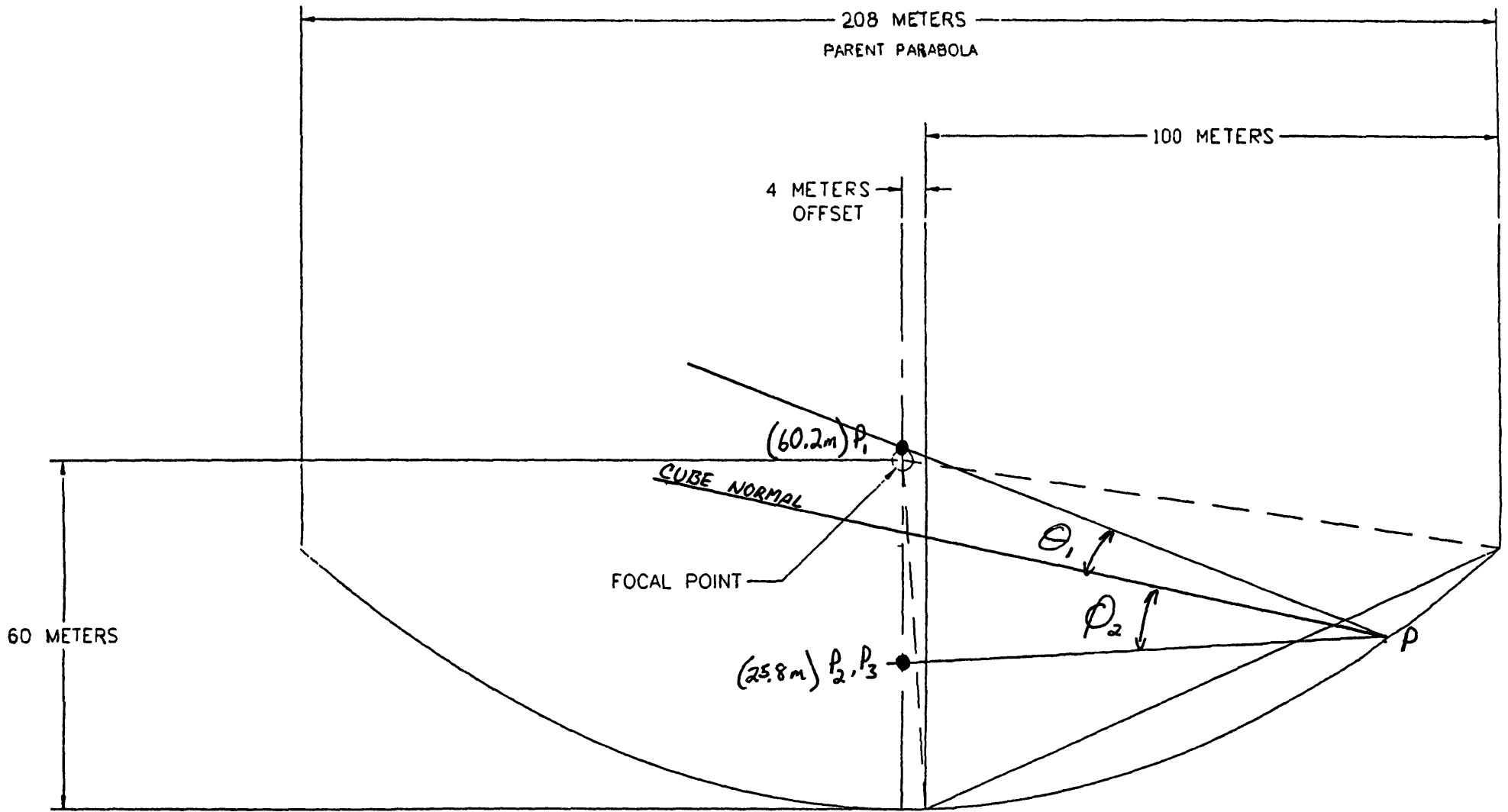
15° cone through  
surface at 35° offset.

Figure



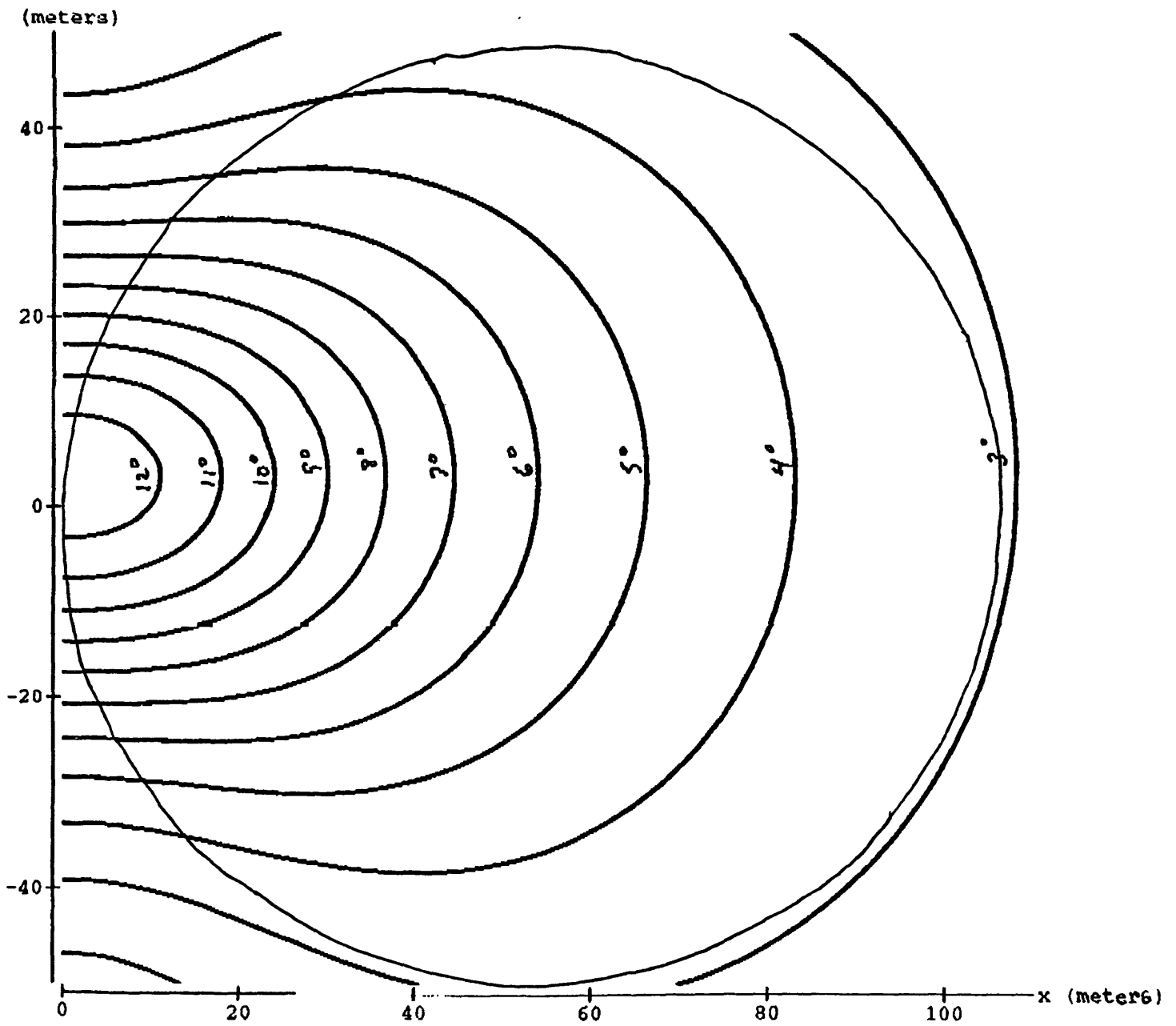
GBT REFLECTOR  
(TOP VIEW)

Figure 2



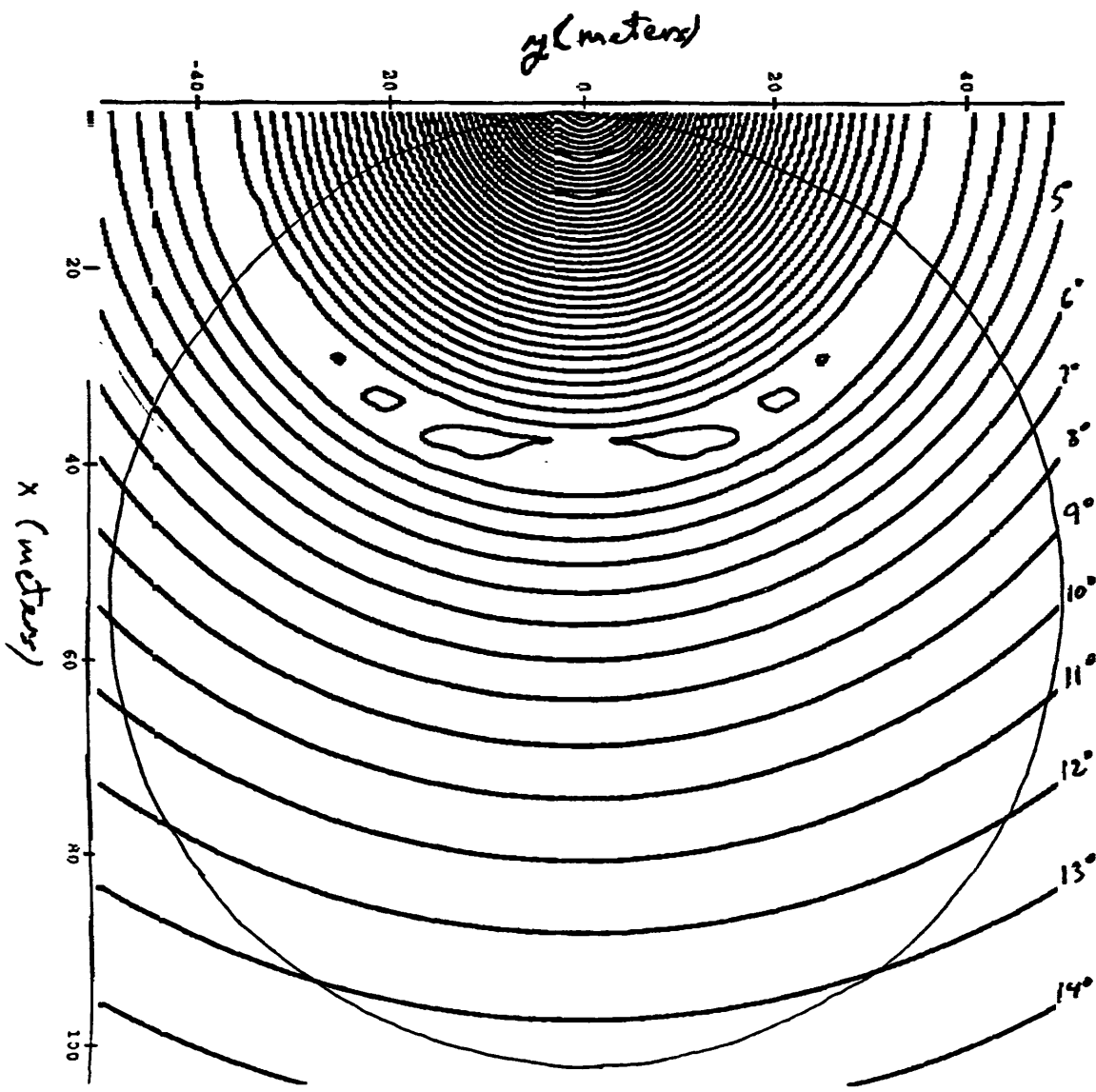
GBT REFLECTOR GEOMETRY

Fig 2a



Angle  $\phi_i$   
 45° offset zone  $< 6^\circ$

Figure 3

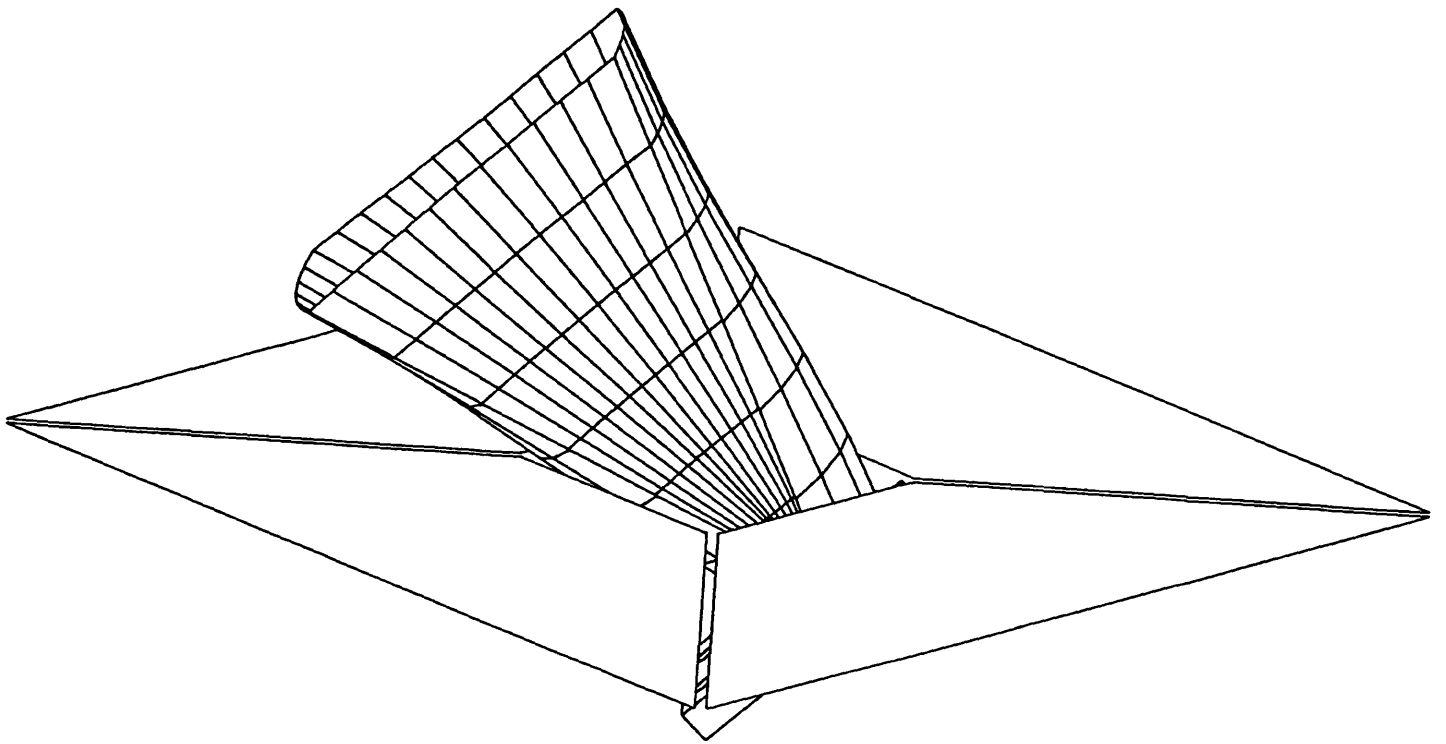


Angle  $\phi_2$

45° offset zone from 14° to 6°

NOTE: Plot assumes all cubes tilted 45°

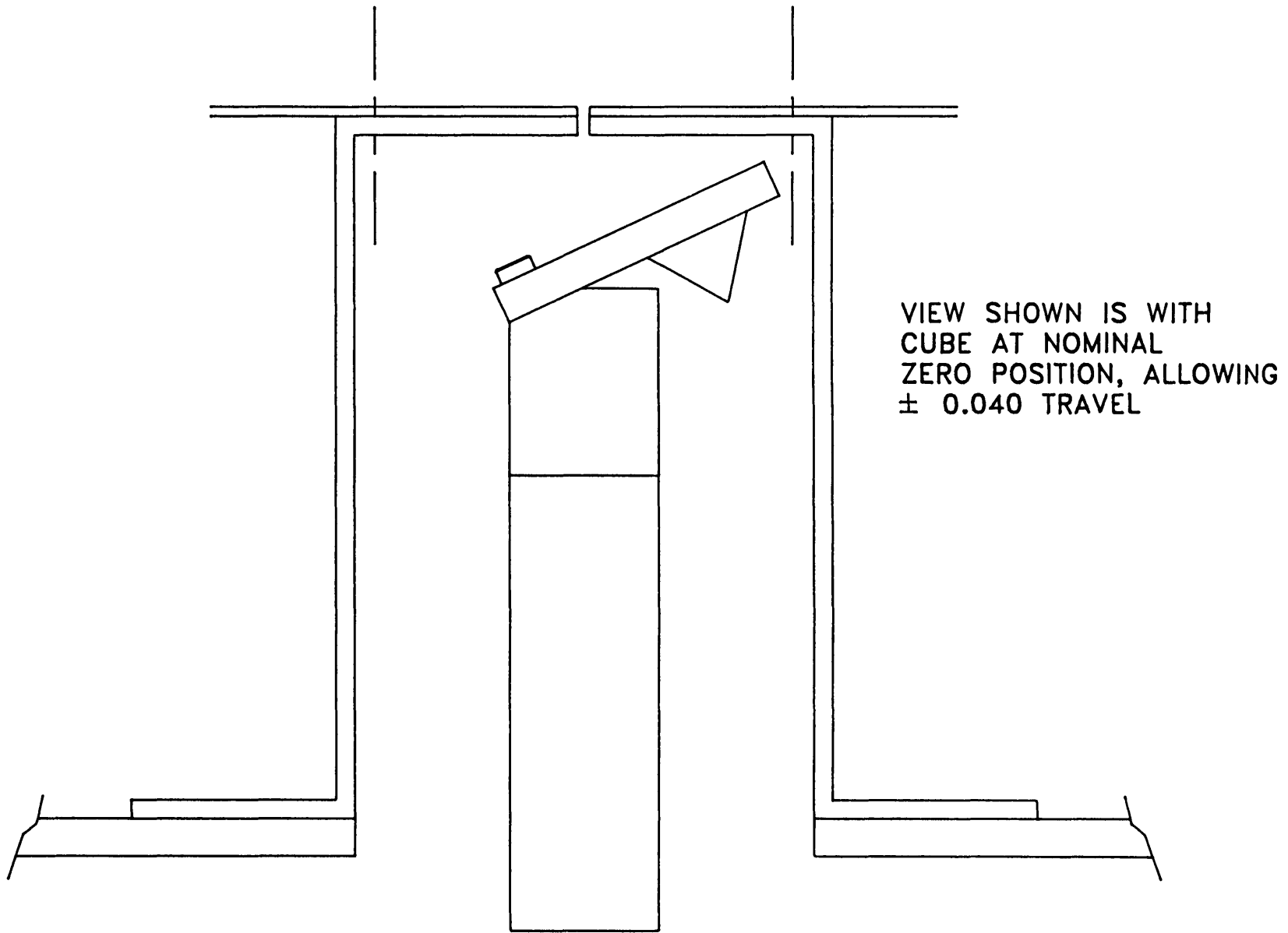
Figure 4



CLEARANCE THROUGH SURFACE  
AT 45° OFFSET

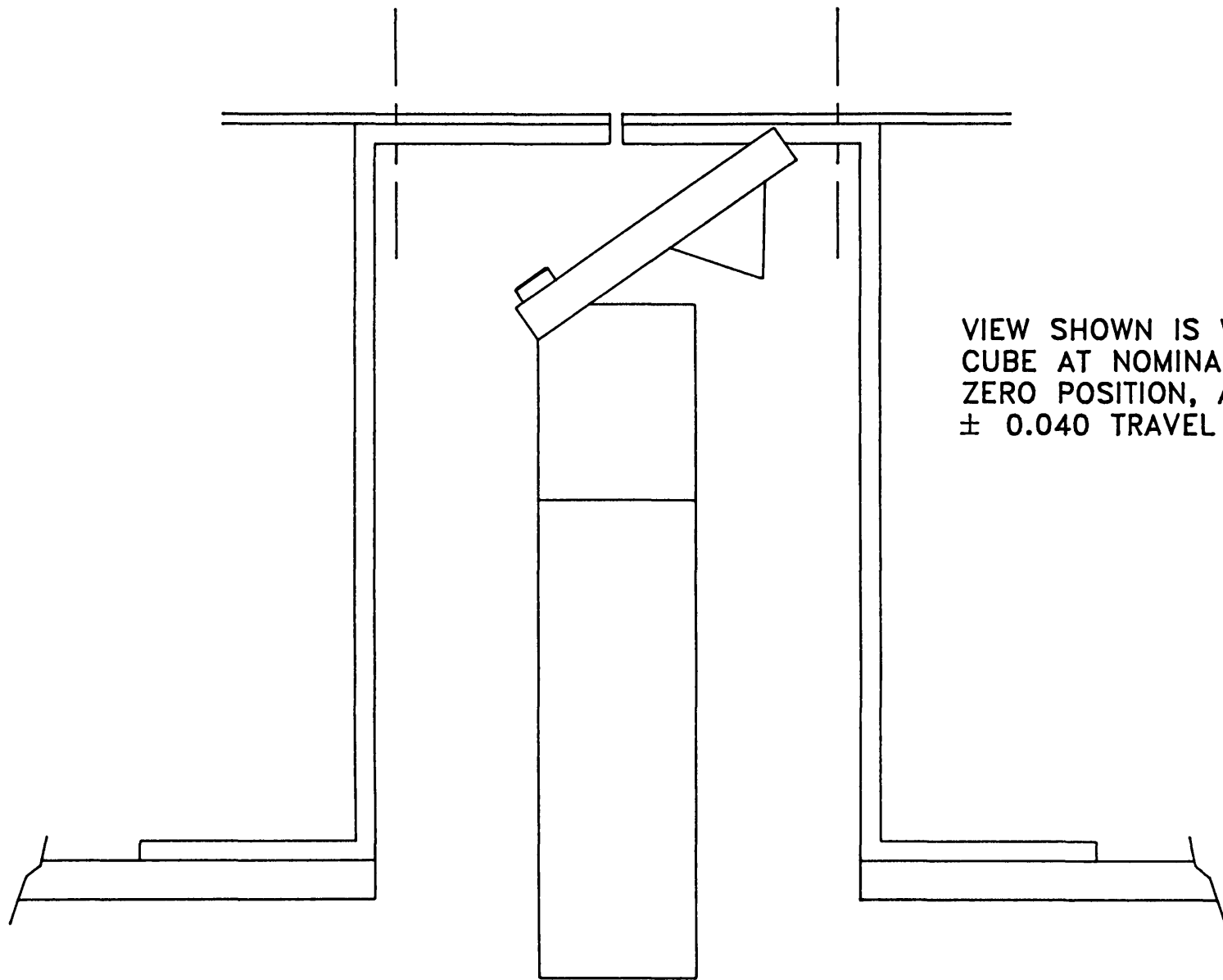
Figure 5





25'

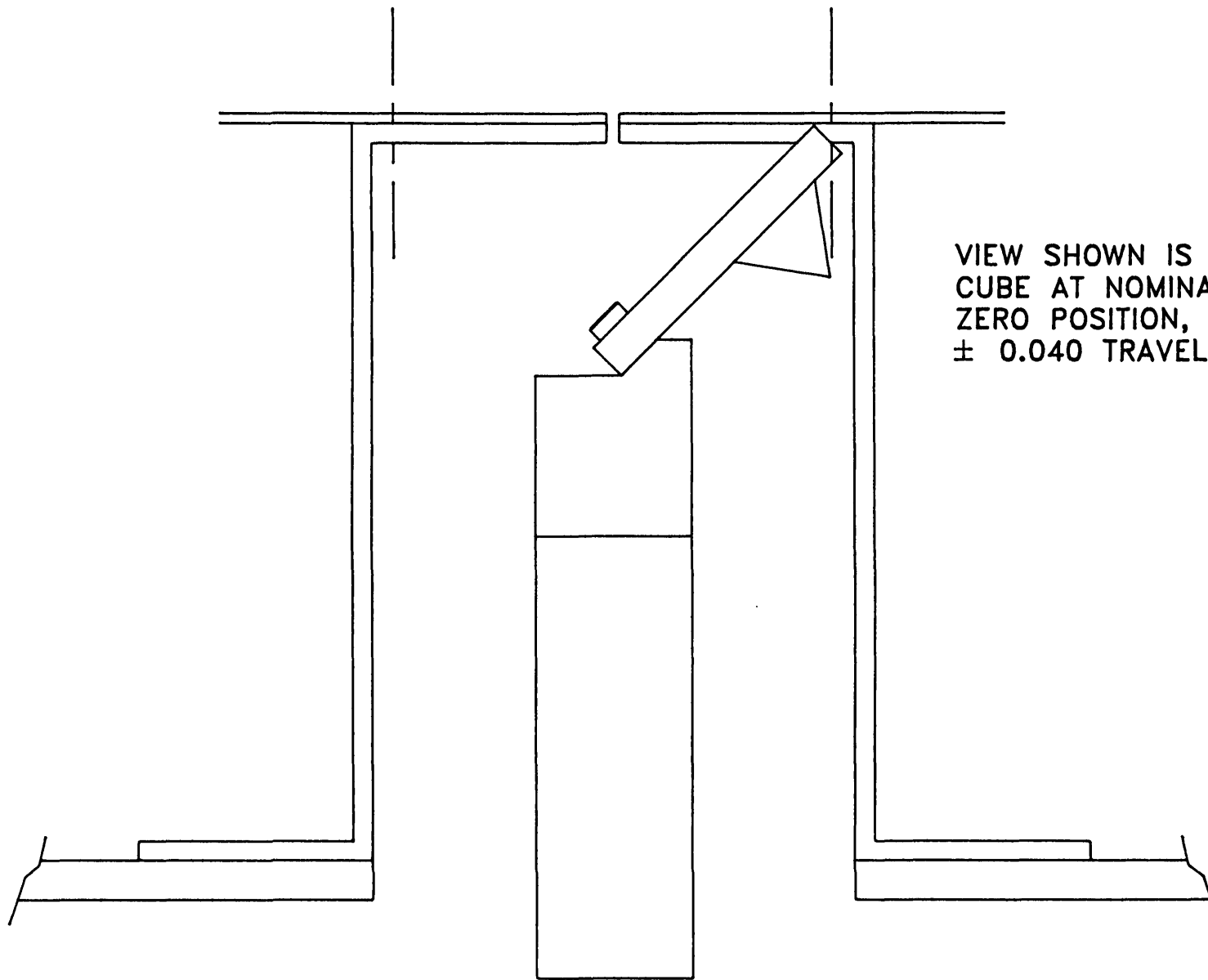
*Figure*



VIEW SHOWN IS WITH  
CUBE AT NOMINAL  
ZERO POSITION, ALLOWING  
 $\pm 0.040$  TRAVEL

35°

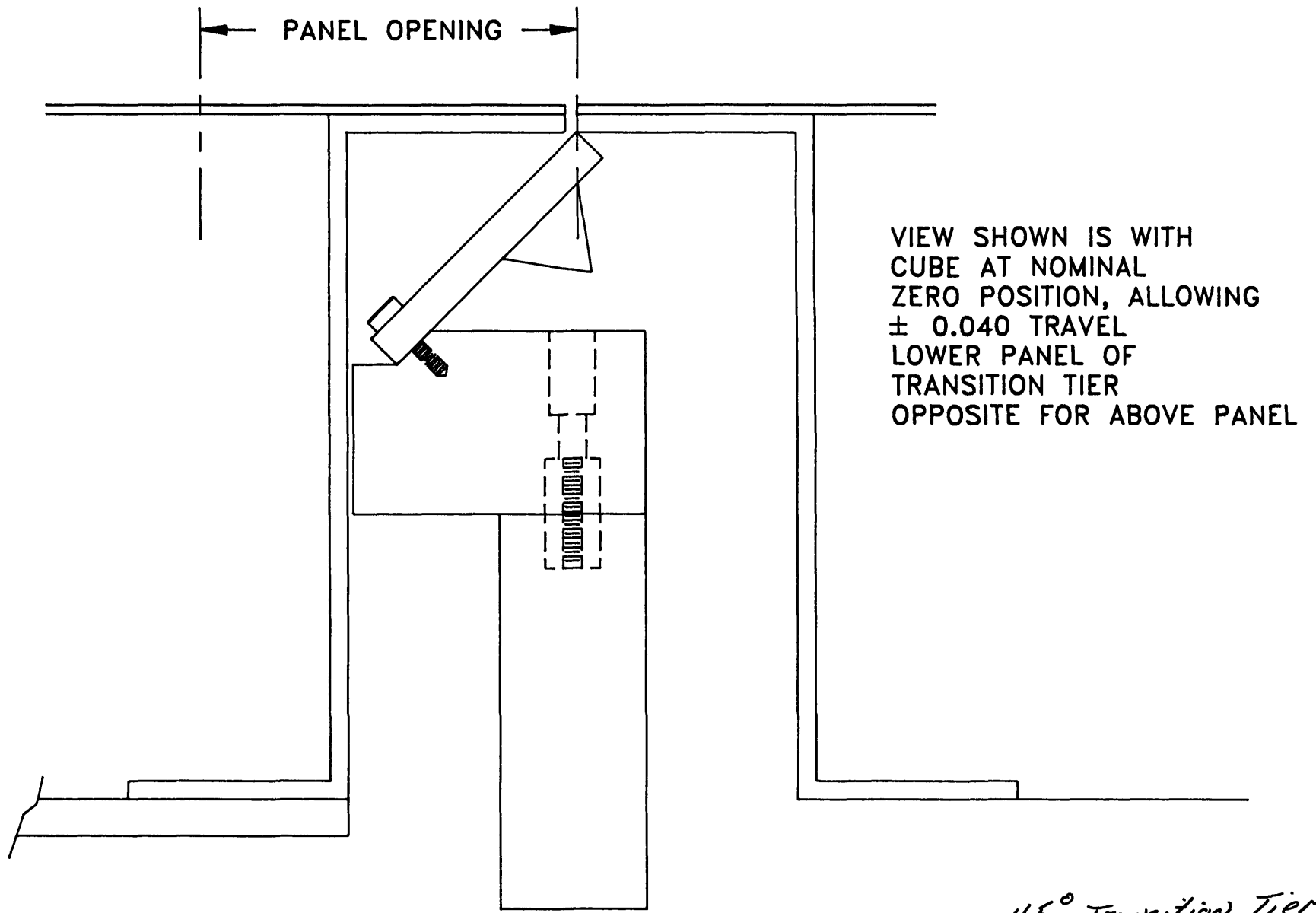
Figure 7



VIEW SHOWN IS WITH  
CUBE AT NOMINAL  
ZERO POSITION, ALLOWING  
 $\pm 0.040$  TRAVEL

45°

Figure 8



*45° Transition Tier  
Bracket*

*Figure 1*